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TRANSMITTAL LETTER

In re Application of:
Paul M. VANDEVOORDE et al.

Serial No.: 09/444,968

Filing Date: November 22, 1999

For: COATING COMPOSITION BASED
ON A HYDROXY GROUP-CONTAINING FILM
FORMING POLYMER, A POLYISOCYANATE
COMPOUND, AND A DIOL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Docket No.: ACO 2587 P1US

Examiner: Melanie D. Bissett

Group Art Unit: 1711

OFFICIAL

CERTIFICATE OF FACSIMILE TRANSMISSION

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on JULY 26, 2004

Christina Cangelosi
Christina Cangelosi

Sir:

☒ Transmitted herewith find the document(s) related to this application.

TRANSMITTAL LETTER IN DUPLICATE; RESPONSE TO REPLY BRIEF; APPENDIX; AND
CERTIFICATE OF FACSIMILE

☐ Applicant hereby petitions for an extension of time under 37 CFR 1.136 of:

☐ One Month (\$110.00)

☐ Two Months (\$420.00)

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☐ Four Months (\$1480.00)

The total fee believed due is \$ 0.00. Please charge this amount and any other fees which may be due (including filing fees under 37 CFR 1.16 and processing fees under 37 CFR 1.17) to Deposit Account No. 01-1350. If an extension of time is required but has not been requested above, Applicant hereby petitions for an extension of time sufficient for the attached document(s) to be timely. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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Patent**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

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REPLY BRIEF ON APPEAL

Respectfully submitted,

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REPLY BRIEF ON APPEAL

Sir:

I. INTRODUCTION

Pursuant to the provisions of 35 U.S.C. §134 and 37 C.F.R. §1.193, this paper is submitted as a reply setting forth the authorities and arguments upon which Appellant relies in response to the Examiner's Answer dated May 23, 2004. As previously stated, the present application was originally filed with claims 1-17. In response to a restriction requirement, Applicants filed their Response to Restriction Requirement, faxed January 16, 2001, in which Applicants elected to prosecute claims 1-6 and 12 and withdrew claims 7-11 and 13-17, with traverse. Claim 6 was allowed in the Office Action dated, November 29, 2001. As pointed out by the Examiner, claim 6 was already rewritten in

independent form (set out in the Appendix attached herein). Thus, claims 1-5 and 12 are currently pending in this application and stand herein on Appeal.

The following remarks address the comments in the Examiner's Answer and are meant to supplement and not supercede the arguments put forth in the Applicants' Appeal Brief.

II. REPLY

The Rejection of Claims 1-2, 4-5 and 12 Under 35 U.S.C. §102(e) Over Ho

Applicants respectfully disagree the Examiner's statements regarding Ho. Under the standard of anticipation, Ho does not disclose the present invention. Ho must contain **within its four corners a sufficient description to enable one to practice the invention of the rejected claims without undue experimentation or inventive skills.** *Akzo N.V. v. U.S. Intern. Trade Com'n*, 1 USPQ2d 1241, 1245 (Fed. Cir 1986). As set forth previously and as described by the Examiner, Ho does not anticipate the present invention.

In his Answer, the Examiner erroneously alleges that Ho exemplifies the combination of a carboxyl modified polyol having hydroxyl values of 75 to 300 mg KOH/g with an isocyanate and 2-butyl-2-ethyl-1,3-propanediol to form a coating.

Actually, Ho discloses from col. 8, l. 65, to col. 9, l. 17, that the urethane prepolymer useful in Part A of the composition is the reaction product of

- a) a diisocyanate;
- b) a carboxyl-functional diol having a hydroxyl equivalent weight up to 2000 (corresponding to a hydroxyl number above 28 mg KOH/g);
- c) optionally an alkyl siloxane diol/diamine or a fluorinated diol/diamine;
- d) optionally a polymeric diol and;
- e) optionally a chain extender selected from diols, triols, and mixtures thereof.

The carboxyl-functional diol b) is further described as having a hydroxyl equivalent weight of about 60 to about 2000 (corresponding to a hydroxyl number of 28 to 935 mg KOH/g) (col. 10, ll. 23 – 27).

Examples of diols suitable as optional chain extender e) are mentioned in col. 12, ll. 39 – 46. 2-Butyl-2-ethyl-1,3-propanediol is not mentioned here.

Example 8 of Table 5 in col. 38 of Ho discloses a composition comprising

- a) a diisocyanate (Desmodur W);
- b) a carboxyl functional diol having a hydroxyl number of 769.5 mg KOH/g (Polyol I);
- c) an alkyl siloxane diol having a hydroxyl number of having a hydroxyl number of 572.4 mg KOH/g (Polyol IV) and;
- e) a chain extender being a mixture of trimethylolpropane and 2-Butyl-2-ethyl-1,3-propanediol.

However, there is no disclosure in Ho of a composition according to current claim 1. The range of hydroxyl numbers of 28 to 935 mg KOH/g generally refers to component a) of components a) to e) which are reacted to form the urethane prepolymer, which may or may not comprise a diol chain extender. Ho neither mentions nor suggests replacing the carboxyl functional diol of the particular Example 8 having a hydroxyl number of 769.5 mg KOH/g with a carboxyl functional diol having a hydroxyl number in the range of 75 to 300 mg KOH/g.

Furthermore, even assuming arguendo that the ranges were applicable to the present invention, it would be questionable that the disclosed claimed range was disclosed with sufficient specificity to be anticipatory to the present invention. M.P.E.P. § 2131.03. In the present invention, the selected range of hydroxyl numbers is purposeful, since it allows the formulation of a coating composition combining certain properties.

Claims 1 – 3, 5, and 12 stand rejected for alleged anticipation by Mayer

As stated in the Appeal Brief, Applicants respectfully traverse the Examiner's rejection of claims 1-3, 5 and 12 as allegedly anticipated by Mayer. Mayer discloses a coating composition comprising a component (I) containing a binder and a component (II) containing a polyisocyanate. Component (I) comprises an acrylate copolymer and optionally a polyurethane resin (col. 15, ll. 56 – 67). The polyurethane resin may be prepared by reacting isocyanato-containing prepolymers with compounds which are reactive toward isocyanate groups (col. 12, ll. 13 – 16). 2-butyl-2-ethylpropane-1,3-diol is mentioned as a suitable compound which is reactive with isocyanate groups (col. 13, ll. 15 – 23).

The hydroxyl groups of the diol and the isocyanate groups of the prepolymer undergo an addition reaction to form urethane groups. **The polyurethane resin thus prepared no longer comprises the starting compounds**, i.e. the diol as a compound with hydroxyl groups and the polyisocyanate, but a polymer having urethane groups.

Mayer does not disclose a coating composition comprising a diol according to the formula of current claim 1.

Claim Rejections under 35 USC § 103(a) over Ho

The Examiner has maintained his obviousness rejection based on Ho. Claim 3 stands rejected for alleged obviousness over Ho. Ho notes the possible addition of a polyacrylate polyol to part A of the two-part composition (col. 16, ll. 18 – 34). Part A of the two-part compositions of Ho can comprise components (a) – (h) for water borne compositions (col. 2, l. 38 – col. 3, l. 18) and components (a) – (g) for non-aqueous

compositions (col. 4, l. 39 – col. 5, l. 14). The optionally present polyacrylate polyol corresponds to component (b) of part A of said two-part compositions. However, none of the components (a) – (h) and/or (a) – (g) of part A corresponds to the diol according to the formula of instant claim 1.

Furthermore, as set forth in the Appeal Brief (concerning the difference between a composition comprising a diol and a polyisocyanate and a composition comprising a polyurethane which is the reaction product of the components), it should be realized that part A of Ho's two-part composition does not comprise a diol according to the formula of instant claim 1, even if a polyurethane corresponding to component (a) is the reaction product of such a diol and isocyanates.

Accordingly, including a polyacrylate polyol in part A of the two-part composition of Ho does not lead to the composition of instant claim 3. Therefore, claim 3 is not obvious in view of Ho.

In item 11 of the Answer, the Examiner states that the Examples provided in the current application suggest coating compositions comprising the reaction products of the claimed components.

Actually, the wording of claim 1 does not exclude the additional presence of reaction products of the claimed components. Such products are even explicitly specified in allowed claim 6. However, the possible additional presence of such reaction products does not justify the Examiner's wrong interpretation according to which claim 1 would read **on a composition completely lacking of the components as claimed and comprising only the reaction products thereof.**

It is emphasized that the current invention is not defined by the absence of particular reaction products, **but by the presence of the components according to claim 1.**

With regard to the Examiner's remarks with respect to coatings, as explained previously, the function of any surface coating is twofold: to protect and to decorate. This basic knowledge can for example be inferred from the textbook by J.Bentley and G.P.A. Turner, *Introduction to Paint Chemistry*, Chapter on "first principles", last sentence of first paragraph on p. 91. **Since the twofold function is a requirement for any surface coating, there is no need to explicitly limit the wording of the claims or specification to protective and decorative coating compositions.** In view of the required twofold function of any surface coating, the Examiner's interpretation of a coating composition as composition capable of coating at least a portion of a substrate is inappropriate. See for example, *Introduction to Paint Chemistry*, a copy is submitted herewith.

Furthermore, the statement that the composition of Example 8 of Ho cannot function as a coating composition is maintained and substantiated. As explained in the response filed on May 29, 2002, the theoretical number average weight (Mn) of the polyurethane after complete reaction of the components of Example 8 of Ho is 286. There are no air-drying groups or chemical crosslinkers present. Therefore, the composition is not capable of forming a crosslinked polymer film. Thus, the composition can only dry by evaporation of solvent and water. However, a skilled person knows that a coating drying by evaporation requires a high molecular film forming polymer. This can for example be inferred from the textbook by J.Bentley and G.P.A. Turner, *Introduction to Paint Chemistry*, Chapter on "first principles", p. 101, Table 7.1., previously submitted with the response after final, dated February 10, 2003.

In a chemical reaction a compound serving as starting material is transformed to a reaction product, which is a different compound from the starting material. Therefore, in a claim reading on a composition comprising particular chemical compounds, there is no need to explicitly limit the claim to the unreacted compounds.

intermediaries and if the elements were found at any stage, they would have to address an anticipation question. This simply is not the state of the law. In order to anticipate, one skilled in the art reading the prior art would have to be enabled to make the compound, which certainly is not the case in the present application. One reading the prior art here, would not be enabled to form the compound of the present invention.

If there is not a reasonable certainty that the claimed subject matter will necessarily result, a rejection based on anticipation must fail. In re Brink, 164 USPQ 247, 249 (CCPA 1970). In the present instance, nothing in Ho discloses the coating composition of the present invention having AS SEPARATE (NON REACTED) components a diol and diisocyanate....and nothing in the Ho examples results in a coating composition having AS SEPARATE (NON REACTED) components, a diol and diisocyanate.

The requirement that an enabling disclosure **place the public in possession** of the invention is consistent with the fundamental purpose of the patent law to promote the sciences and useful arts through the disclosure of useful knowledge. Akzo N. V. v. U. S. Int'l Trade Comm'n, 808 F.2d at 1479, 1 U.S.P.Q.2d at 1245 (stating that when a prior art reference would enable the worker of ordinary skill to practice the invention, it is deemed to have placed the invention in the possession of the public as well), cert. denied, 482 U.S. 909 (1987).

The mere disclosure of the formula or sequence of words used to designate a compound does not, by itself, anticipate that compound. See In re Brown, 329 F.2d 1006, 1011, 141 U.S.P.Q. 245, 249 (C.C.P.A. 1964). **If the prior art fails to provide a method for producing the compound**, and no method is known or obvious to those of skill in the art, then the reference has not placed the compound in the possession of the public and therefore does not anticipate the claimed invention. See In re Hoeksema, 399 F.2d 269,274,158 U.S.P.Q. 596,601 (C.C.P.A. 1968).

Furthermore, as previously submitted, the difference between a composition comprising a diol and a polyisocyanate and a composition comprising a polyurethane is that a diol is a compound of a specified formula characterized by a special arrangement and connectivity of atoms, and by the presence of functional groups, namely two hydroxyl groups. Meanwhile, a polyisocyanate comprises a plurality of isocyanate groups. The hydroxyl groups of the diol and the isocyanate groups of the polyisocyanate can undergo an addition reaction to form urethane groups. A polyurethane resin thus prepared no longer comprises the starting compounds, i.e. the diol as a compound with hydroxyl groups and the polyisocyanate having isocyanate groups, but a polymer having urethane groups.

Finally, a skilled person is very well aware of the differences between a composition comprising a diol and a polyisocyanate and a composition comprising a polyurethane. For coating compositions in particular, these differences are of great importance. Accordingly, a skilled person will not be enabled from the disclosure in a piece of prior art for a coating composition comprising a polyurethane as the reaction product of a diol and a polyisocyanate, to produce a coating composition comprising a diol and a polyisocyanate.

However, as stated above, a skilled person knows that the function of any surface coating is twofold: to protect and to decorate.

III. CONCLUSION

In view of the arguments presented herein above appellants respectfully submit that claims claims 1-5 and 12 stand improperly rejected over the applied art. The Honorable Board is therefore respectfully requested to reverse the Examiner and pass all of the claims claims 1-5 and 12 to issue.

Respectfully submitted,



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The following arguments are "European" arguments and may or may not be useful US proceedings:

- The range of hydroxyl numbers of the film forming polymer of 75 to 300 mg KOH/g according to current claim 1 is narrow compared to the broad range of 28 to 935 mg KOH/g as described by Ho.
- The range according to claim 1 is far removed from the Examples disclosed by Ho, i.e. a hydroxyl number of 769.5 mg KOH/g in Example 8.

A scan of Table 7.1 is attached.

APPENDIX**CLAIMS**

1. (Original) A coating composition comprising a hydroxy group-containing film forming polymer with a hydroxy value between 75 and 300 mg KOH/g solid resin, a polyisocyanate compound, and a diol of the general formula $\text{HO}-\text{CH}_2-\text{CR}(\text{C}_2\text{H}_5)-\text{CH}_2-\text{OH}$, wherein R is an alkyl group having 3-6 carbon atoms.
2. (Original) The coating composition according to claim 1, wherein R is n-butyl.
3. (Original) The coating composition according to claim 1, wherein the hydroxy group-containing film forming polymer is a hydroxy group-containing polyacrylate.
4. (Original) The coating composition according to claim 1, wherein the diol is present in the coating composition in an amount of 1 to 25% by weight, based on the weight of the hydroxy group-containing film forming polymer.
5. (Original) The coating composition according to claim 1, wherein the composition comprises less than 500 g/l of volatile organic solvent based on the total composition.
6. (Allowed) A coating composition comprising a hydroxy group-containing film forming polymer with a hydroxy value between 75 and 300 mg KOH/g solid resin, a polyisocyanate compound, and a diol of the general formula $\text{HO}-\text{CH}_2-\text{CR}(\text{C}_2\text{H}_5)-\text{CH}_2-\text{OH}$, wherein R is an alkyl group having 3-6 carbon atoms and further comprising a polyester or polyurethane having units derived from the diol.

7. (Withdrawn) A method of coating which comprises applying a coating composition according to claim 1 to a substrate.
8. (Withdrawn) The method according to claim 7, wherein the coating composition is applied by spraying it on a substrate.
9. (Withdrawn) The method according to claim 7, further comprising curing the coating composition at temperatures between 0 and 80°C.
10. (Withdrawn) A coated substrate wherein the substrate is applied according to the method of claim 7.
11. (Withdrawn) A coated substrate according to claim 10, wherein the substrate is an automobile or a large transport vehicle, such as trains, buses, and airplanes.
12. (Withdrawn) The coating composition according to claim 1, wherein the coating composition is a clearcoat composition.
13. (Withdrawn) A method of coating, which comprises applying a clearcoat composition according to claim 12 to the surface of a basecoat.
14. (Withdrawn) The method according to claim 13, wherein the clearcoat composition is applied by spraying it onto the surface of a basecoat.
15. (Withdrawn) The method according to claim 13, further comprising curing the coating composition at temperatures between 0 and 80°C.
16. (Withdrawn) A coated substrate wherein the substrate is applied according to the method of claim 13.

17. (Withdrawn) A coated substrate according to claim 16, wherein the substrate is an automobile or a large transport vehicle, such as trains, buses, and airplanes.

Introduction to
Paint Chemistry
and principles of paint technology

J. Bentley

and

G. P. A. Turner

*Both formerly with ICI Points
Slough, Berkshire, UK*

Fourth edition



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Seven

Paint

first principles

In this chapter, we describe the basic nature of paint, making clear its function, and describe the various routes to attaining the final properties we require.

Wet paint: paint in the can

All objects are most vulnerable at their surfaces. It is the surface of any article that makes continual contact with the air, which may be moist, corroding or oxidizing. The surfaces of objects left in the open bear the brunt of the sun, rain, fog, dew, ice and snow. Under these conditions iron rusts, wood rots (or shrinks and cracks) and road surfaces crack and disintegrate. These, and more sheltered objects, suffer the wear of daily use, scratches, dents and abrasions – at their surfaces. To prevent or to minimize damage, various coatings are applied to these surfaces to protect them. Coatings can also be used to decorate the articles, to add colour and lustre and to smooth out any roughness or irregularities caused by the manufacturing process. Thus the function of any surface coating is twofold: to protect and to decorate.

There are many surface coatings that do this: wallpaper, plastic sheet, chrome and silver plating. No coating material is more versatile than paint, which can be applied to any surface, however awkward its shape or size, by one process or another. Paint is a loosely used word covering a whole variety of materials, with names sometimes more descriptive of their composition or function: enamels, lacquers, varnishes, undercoats, surfacers, primers, sealers, fillers, stoppers and many others. It is essential to grasp at once that these and other less obviously related products, such as plasters, concrete, tars and adhesives, are all formulated on the same basic principles and contain some or all of three main ingredients.

First a **pigment** may be included. Pigments have both decorative and protective properties. The simplest form of paint is whitewash and, when dry, whitewash is nothing more than a pigment – whiting (calcium carbonate) – spread over a surface. It decorates and to some extent it